INSTITUTE *of* STATISTICS
OXFORD

Bulletin Vol. 4. *August 8, 1942* *No. 11*

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EDITORIAL NOTE.

Subscriptions to the Bulletin should be sent to Basil Blackwell, 49 Broad Street, Oxford; the cost of each issue is 2s. 6d., and of a yearly subscription (three-weekly issues) 22s. 6d.

The views and recommendations put forward in signed articles are those of the respective authors, and not necessarily those of the Institute of Statistics or of the Editor of the Bulletin.

The Binding Case for the Bulletin, Volume 3, 1941, is now ready and can be obtained from the Publisher, pric 3/6, post free.

THE ALUMINIUM REVOLUTION

Modern war, in which the extent and character of airforces are determined by the quantities of aluminium available, has transformed the aluminium industry into the world's largest non-ferrous metal producer. During 1913—18 world production of aluminium had risen by 70,000 tons.[1] Although in the summer of 1939 ten times greater than at the outbreak of the first world war, aluminium production has in 2½ years of the present conflict increased by over 1 million tons. Surpassing in 1941, for the first time, the 1 million ton limit, world output is expected, at the end of 1942, to exceed 2 million tons. The magnitude of a yearly output which it had taken half a century to attain will be doubled in the course of one year. Thus, we may well speak of a revolutionary change which will affect costs of production, the regional distribution of aluminium capacity and the competitive strength of aluminium with respect to other non-ferrous, and partly ferrous metals.

Since both belligerents had sufficient resources of the necessary raw material, bauxite,—the Axis powers achieved self-sufficiency by territorial conquests—no substitute materials had to be developed and the needs of the expanding aeroplane production, with explosive force, inflated the aluminium industry. In the following pages some problems connected with the expansion of the aluminium industry during the war are surveyed. All estimates and conclusions are based on the collection and analysis of available published data and may have to be modified in the light of facts not known to the author. Within these limits an attempt is made to give an idea of the various possible bottlenecks and of the magnitude of output in the chief producing countries.

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[1] Tons referred to in the text are metric tons.

1. *Primary Aluminium Production.*

TABLE I.

Primary Aluminium Production, in '000 metric tons.

	1939	1940	1941	1942[1]
World	*680*	*770*	*1000—1100*	*1800*
U.S.A.	148	180	300	500
Canada	75	85	245	355
Great Britain	25	28	35	50
U.S.S.R.	60	65	65	55
United Nations	*308*	*358* *53*[2]	*645*	*960*
France, Norway, Switzerland	109	53[3]		
Germany	200	240	560	800
Rest of Europe	34	37		
Japan	23	30	40	60
Axis controlled	*257*	*360*	*600*	*860*

The 1942 figures represent estimates based on statements of representatives of the United Nations. The Axis has not published 1942 estimates but we may assume a rate of expansion lying below the Axis rate in 1941 and the United Nations rate in 1942.

As can be seen from Table I, the United Nations possessed throughout a potential superiority in the material for aeroplane construction. U.S.A. has achieved record speeds in the establishment of new aluminium plants. Reynolds Metal Co. completed one of their plants six months after the ground had been broken. Another plant was completed in 18 weeks. It remains to be seen to what extent the decision of the U.S.A. authorities taken in May 1942 to interrupt the long-term construction programme in favour of the short-term record output of war weapons, in the framework of existing productive capacity, will affect the erection of new aluminium and alumina plants. In the 9 months, from June 1941 to March 1942, monthly output of virgin aluminium in U.S.A. had risen by 8,000 tons to 32,000 tons, equalling an annual production of about 385,000 tons. Five aluminium plants, operated by the Aluminium Corporation of America (Alcoa) on behalf of the Defence Plant Corporation, with an annual capacity of 225,000 tons, were expected to operate from the middle of summer, thus adding another 95,000 tons during 1942, bringing the total to 480,000. If we take further into account the expansion programme undertaken by

[1] Estimate.

[2] First half year.

[3] Second half year.

Alcoa on its own account and other new Government plants in process of construction, American total output for 1942 may be some 500,000 tons, and her capacity towards the beginning of 1943 between 700,000 and 800,000 tons. Production capacity planned was raised, in April 1942, from 800,000 tons to 1,100,000 tons, a goal that may be reached during 1943.

2. *Ore requirements.*

In order to obtain 1 ton of virgin aluminium, 4 tons of crude ore have to be mined and transported to the alumina works where the pure ore, alumina, is extracted from the bauxite. Thus, 800,000 tons of aluminium correspond to the mining and transporting of 3.2 million tons of crude ore, for whose conversion into 1.6 million tons of alumina 4.0 million tons of coal, or double this quantity of brown coal, are needed. Canadian production of 355,000 tons of aluminium will necessitate the importation of 1,400,000 tons of bauxite and British production will call for another 200,000 tons. Accordingly, total requirements of Great Britain, Canada and U.S.A. will, towards the end of 1942, run at an annual rate of 4.8 million tons of bauxite.

These quantities refer to bauxite with at least 50% alumina content, and with a silica content of less than 7%. One third of America's 29 million tons bauxite deposits do not fulfil these conditions. 20% of British Guiana's bauxite mined in 1938 contained also less than 50% alumina. Bauxite not suitable for aluminium production is used mainly in the chemical and abrasive industries which, in 1941, consumed 30% of available bauxite (in U.S.A.). Allowing 1 million tons for their requirements, the rate of total yearly bauxite consumption of the above allied countries towards the end of 1942 will amount to 5.8 million tons.

The Allies lost with Malaya, D.E. Indies and France a yearly output of bauxite of 1 million tons (1940 data) to the Axis. Since the deposits still at their disposal in U.S.A., British and Dutch Guiana yielded in 1939, 1,300,000 tons and were expected to yield 3.8 million tons in 1942—a considerable gap between requirements and supplies has to be filled.

3. *Shipping Needs.*

Provided that 1.5 million tons will be mined in U.S.A., shipping space for the remaining 4.3 million tons has to be made available. In order to calculate the shipping space necessary we assume—with an unavoidable margin of error—an average load per ship of 10,000 tons, an average speed of 12 miles per hour and an average distance of 2,800 miles Guiana—U.S.A. (Gulf of Mexico), of 4,000 miles Guiana—Canada (St. Lawrence) and 4,000 miles Guiana—Great Britain (Liverpool). A ship may require for the 8,000 miles round journey 28 days and, allowing for loading and unloading, 35 days. Taking into account time for repair and overhauling, a ship may make 9 round journeys a year and thus transport 90,000 tons. The importation of Canada's 1.7 million tons bauxite required will, therefore, necessitate about 19 ships carrying 190,000 tons. U.S.A. will need 22 ships making 11 round trips and transporting 2.4 million tons. Great Britain will require three ships making 9 round trips and carrying 240,000 tons. If we take also into consideration sinkings, some 50 ships with a deadweight tonnage of about 500,000 tons will be required for bauxite shipments. We also have to allow for fuel (included in deadweight tonnage). A steamship consumes, on the average, 1½ lb. of coal per horsepower-hour and 1 lb. of fuel for oil burning boilers. Assuming a 4,000 h.p. machinery, on a journey to Canada some 1000 tons of coal or 650 tons of oil will be consumed and on a journey to U.S.A. 750 tons of coal or 500 tons of oil. Thus, for fuel, 5% to 10% of deadweight tonnage has to be added. The total deadweight tonnage necessary for the transport of the required quantities of bauxite will, therefore, be in the neighbourhood of 550,000 tons.

4. *Power and other factors.*

Another problem arises with the supply of power for aluminium production. 22,000 kw. hours of electricity are needed in order to convert 2 tons of alumina into 1 ton of aluminium. The output of 800,000 tons of aluminium consumes 17,600 million kw. hours equalling 39% of total hydro-electric energy produced in U.S.A. in 1938 or 18% of her total installed hydro-electric capacity. Canada, also short of electric power, has informed the U.S.A. that the delivery of newsprint will have to be curtailed for the sake of higher aluminium production.

For the conversion of alumina to aluminium 200 lbs. of cryolite have to be employed per ton of aluminium. Consequently, 800,000 tons or 1.1 million tons of aluminium will require 72,000 or 98,000 tons of cryolite, obtainable only in Greenland, which increased its exports from 17,000 tons in 1935 to 50,000 tons in 1938. Cryolite can also be produced synthetically, requiring a high percentage of fluorspar. U.S.A. is the world's chief producer of fluorspar and considerable deposits exist in U.K., while Canada is without her own resources. The bulk of fluorspar, however, is used in the manufacture of steel. With about 9 lbs. of fluorspar used per 1 ton of steel, a steel output of the British Empire and U.S.A. of 110 million tons will require 450,000 tons of fluorspar whose production in the above regions amounted to 220,000 tons in the peak year of 1937.

Finally there are two important needs connected with the production of aluminium: ample supply of water for the power works which in the case of severe droughts have to restrict their output of electricity; further, sufficient skilled labour and good working conditions for the employees, since labour conflicts in so decisive an industry are of far reaching consequences. When in Canada, in the first months of this year, a labour conflict led to the closing down of the aluminium industry for 5 days, aeroplane production was necessarily affected by the loss of perhaps 5,000 tons of virgin aluminium. Although Canada has to deliver 340,000 tons to U.S.A. not later than in 1944, Great Britain, whose needs far exceed home production and which is dependent on an uninterrupted flow of imports, has, until now, absorbed most of Canada's aluminium output.

Let us assume that sufficient supplies of bauxite, cryolite, fluorspar, shipping space, electric power and skilled labour are provided in time, the programme of aluminium production fulfilled and that the virgin aluminium reaches the next manufacturing stages. Adequate facilities for the conversion of pig-aluminium into sheet metal, wire, shapes and other fabricated items and into aluminium alloys have to be ready so that their capacity, as well as that of the pig aluminium plant, does not lag behind that of the aircraft and air engine production plants, as was the case in U.S.A.

5. *Aluminium Consumption.*

In calculating the quantity of aluminium available for aircraft production, we have to consider two important factors. Firstly, only 80—85% of total virgin aluminium is available for aircraft production. A certain percentage of aluminium is needed for modern naval construction and other military purposes. Thus, the filling of incendiary bombs consists largely of aluminium.

More important, however, to consider is the fact that 3/4 to 2/3 of virgin aluminium used for this construction of an aeroplane is returned as scrap, only 1/4 to 1/3 being absorbed in the completed machine. Thus, secondary aluminium i.e. aluminium obtained from remelting scrap is, by its repeated turnover, of a greater magnitude than the original virgin metal. In this circular process of aluminium turned to scrap, scrap converted to aluminium and so on, *the percentage loss in remelting and the time taken for one complete circle : metal—aeroplane parts—scrap—metal are decisive factors for the potential of aircraft production.* Well organised collection, sorting and transport of scrap has become as important as the supply of the virgin metal. In U.S.A. scrap dealers withheld scrap after the fixing of maximum prices in March 1941 for speculation purposes, so that important smelting plants were scheduled to close down. Later, scrap was sold, without any regard to fixed prices, on black markets.

In order to establish the relation between virgin aluminium available and aircraft output, we assume that each time 25—35% of the metal used is absorbed in the aeroplane manufactured and 10% is lost, in the circular remelting process, from further use in aeroplane construction. Adding up the secondary aluminium, regenerated again and again in decreasing quantities, we arrive at a total sale of secondary aluminium far in excess of the original tonnage of virgin metal.

Let x be the proportion of aluminium used up in aeroplane parts. Then $(1 - x)$ is left over as scrap after the manufacturing process. If y be the proportion lost in remelting, then $(1 - x)(1 - y)$ is available for the second round of manufacture. Therefore the amount available for aircraft production is $x\,[1 + (1 - x)(1 - y) + (1 - x)^2(1 - y)^2 + \dots]$ and the amount actually going into aircraft production,

$$a = \frac{x}{1 - (1 - x)(1 - y)}$$

If 10% of the quantities used are lost in remelting and each time (*a*) 25%, (*b*) 30%, (*c*) 33% and (*d*) 35% go into aeroplane parts, the proportions of aluminium becoming useless for aeroplane construction are (*a*) 23.1% (*b*) 19%, (*c*) 17.7%, and (*d*) 15.7%.

The quantity of secondary aluminium out of 100 tons of virgin aluminium would amount in the case of (*a*) to 208 tons and in the case of (*b*) to 170 tons. Out of the original 100 tons only (*a*) 77 tons, (*b*) 81 tons, (*c*) 82 tons, (*d*) 84 tons could be employed for aeroplane construction.

The average aeroplane of American design is said to contain 7½ tons of aluminium and a four-engined bomber some 17½ tons. We have to allow for the quantity of other metals contained in aluminium alloys. For instance the content of alloy metals in 'Hiduminium' Alloys produced by 'High Duty Alloys' and widely used in aircraft production, varies from 1% in 'Hiduminium 15' to 15% in 'Hiduminium R.R. 77.'

Assuming a grand average of 9½ tons of aluminium per aeroplane, in case (*a*) 8 aeroplanes can be built out of 100 tons of virgin aluminium. Since of these 8 aeroplanes only 2.6 planes are obtained from virgin metal, the construction of the other 5.4 planes depends entirely on the speed of the scrap turnover. (There is, in addition, scrap from wrecked aeroplanes. The collection of household aluminium scrap is of minor magnitude ; during the collection campaign in U.S.A. 6,000 tons were obtained, and in U.K. some hundred tons.) The U.S.A. programme of 60,000 aeroplanes in 1942 would thus require 750,000 tons of virgin aluminium (the planned 120,000 aeroplanes for 1943 1.5 million tons), a monthly output of 2,400 planes in U.K. would call for another 365,000 tons and Canada's 200 planes monthly account for a further 30,000 tons. Total 1942 requirements of U.K., Canada and U.S.A. will thus amount to 1,145,000 tons. Since only 80—85% of total aluminium available (see Table I) goes into aeroplanes, 15—20% being used for other purposes, the programme of aluminium output would fall short of the programme of aeroplane output. This gap may be closed either by additional expansion of aluminium capacity or by producing a certain percentage of aircraft types with an aluminium consumption below the average. American aircraft producers are developing the replacement of aluminium by plastics in floors for aircraft and intend to apply plastics to bulkheads also.

In the above calculations no account has been given of the position in the U.S.S.R. Official data are scarce, but before the German invasion Russia's aluminium output was estimated at 65,000 tons. Of these 35,000 tons were obtained at the works near the Dnjepr Dam and 20,000 tons in the Volkov and Kandalaksha plants in the Leningrad Tikhvin region. These works have been destroyed. The remaining 10,000 tons were produced in the Kamensk (Ural) works whose capacity was intended to reach 50,000 tons, an output which has possibly been reached meanwhile. It is not known how far the bauxite deposits situated mainly in the Tikhvin region have suffered by last year's war operations. There are still other deposits on the eastern slopes of the Urals which may have started operation after the outbreak of war. Pre-war output of bauxite amounted to 250,000 tons, sufficient for an aluminium capacity of 60,000 tons. The aluminium shortage in Russia has been eased by British deliveries but an American estimate of a Russian monthly output of 2,900 planes seems, measured by the quantities of available aluminium, to err on the optimistic side. However, it has to be kept in mind that there possibly exist aluminium plants unknown to the outside world. This consideration may also apply to Japan.

Space does not allow us to discuss the effect of the great volume of secondary aluminium, aluminium alloys and scrap on the system of maximum prices which mainly refer to virgin aluminium and standard scrap. The relation of stable maximum prices to costs per unit of increased output in an industry with high capital expenditure can also not be examined. But the magnitude of the problems arising from the unique expansion of the aluminium industry may be guaged from the selected facts given above.

S. Moos.

DIFFERENTIAL RATIONING

The necessity for differential rationing may arise for two reasons: (*a*) some workers, because of the character of their work, may require more than the average of a particular product; (*b*) flat rationing may be unjust to poor people either because the product in question represents a higher proportion of their consumption than of that of the more well-to-do; or because the higher income groups may more easily compensate for the reduction in the consumption of this product by more expensive substitutes ; or finally because the rich may be in possession of some stocks of this product.

1. A good example is offered by rationing of bread and flour (including spaghetti and biscuits) which may become necessary in this country as a result of the shortage of shipping space. Not only do manual workers require more bread, which is an energy food, but also flat rationing would mean a much greater hardship for poor people than for the well-to-do. The rations of manual workers should therefore be *considerably* higher than those of the rest of the population, not only on account of their greater physical effort but also because in general they belong to the poorer strata of the population. Even so, the workers' families with many children will be at a great disadvantage both because they are usually the poorest and because the higher bread ration would be given to *earners*. This, however, can be partly remedied by giving relatively high rations to children in general, and would also be mitigated by the fact that large families would usually find it easier to substitute potatoes for bread. These considerations do not aim, of course, at minimising the importance of the 'technical' problem of compensation for greater physical effort, and this requires that rations should be differentiated also among manual workers: heavy workers, for instance miners, should get higher rations than other manual workers.

2. What would be the repercussions of the reduction in bread consumption upon consumption of other food? The consumption of potatoes will increase; this does not present any particular difficulty because the supply of potatoes is ample and may be easily increased.[1] However, there would also most probably be a certain pressure in the demand for other goods. This may necessitate some additional rationing, in particular of products which are more or less close substitutes for bread, as for instance cake. Cake can be included in the points scheme or the scheme for sweets. This measure is in any case overdue, quite apart from the problem of bread rationing. To relieve the position of the poorer population it would be advisable to reduce the prices of products included in the points scheme. This would enable people who do not at present use their ration to buy more. If the supply of 'points foods' is kept constant this would, of course, necessitate the reduction of the ration.

As was indicated in the last Bulletin,[2] the problem of bread rationing would be made very much easier if a small part of the shipping space saved thereby could be used for larger imports of cheese or dehydrated meat. It is generally known that bread consumption in wartime is much higher than in peace-time because people compensate in this way for the deficiency in protein foods. The increase in the supply of the latter would reverse this development and thus it would allow of lower bread rations without imposing great hardship, and would also relieve the pressure on the market for other goods. It is, however, by no means certain whether such a scheme is possible. Larger imports of cheese are dependent on rationing of cheese in the United States.[1] As to the dehydrated meat it is difficult on the one hand to estimate the possibilities, and on the other hand it will perhaps be necessary to use this import to compensate for reduced imports of fresh meat as a result of losses in refrigerator ships. But even if we abstract from the possibility of increasing imports of cheese and meat, there still remains a way of easing the bread position to a certain extent by differential rationing of meat.

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[1] The substantial admixture of potato flour in bread which is sometimes proposed to save wheat is really equivalent to a flat rationing of wheat bread, and should therefore be rejected on the same grounds.

[2] Bulletin, Vol. 4, No. 10 : 'Shipping—The Bottleneck,' by F. Burchardt.

3. Actually, the differential rationing of meat already exists, but it is of a peculiar character. At present all people who have meals in restaurants and canteens enjoy a differential ration of meat, because no coupons are surrendered when eating out. This privileged position of people taking meals in restaurants can hardly be justified. As to the canteens, they *are* a substitute for differential rationing in favour of manual workers, but even here the rationing is of a haphazard nature, not all workers being able to use the facilities of canteens. The situation should be ordered by making it obligatory to surrender meat coupons in restaurants and canteens,[2] and use the surplus of meat saved in this way for increasing uniformly the rations of the manual worker.

This would mean, of course, shifting a certain amount of meat from the better-off populaton to the workers. In the event of bread being rationed this would permit a certain reduction in the workers' bread ration. But differential rationing of meat is useful from the point of view of shipping space even if bread is unrationed. If workers were to receive higher meat rations now this would probably cause a reduction in their present consumption of bread, which has increased, as mentioned above, in war-time as a result of the deficiency in protein foods. On the other hand people eating in restaurants are unlikely to compensate the cut in their consumption of meat by substantially increasing their consumption of bread. They will rather direct their demand to other goods which may—just as the differential rationing of bread—necessitate some expansion in the scope of rationing.

4. It has frequently been proposed that clothes rationing should be on a differential basis because rich people are in possession of considerable stocks. The most satisfactory solution of this is, I think, that proposed by Mr. Burchardt in the article quoted. He argues there that 'Sir William Beveridge's idea of permitting the use of clothing coupons for fuel purchases (in the case of older people) may well be capable of wider application and may be operated the other way round too. The poor could use excess fuel coupons for buying clothes, the rich clothing

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[1] Ibid.

[2] A rough solution of the administrative problem involved is to fix a certain flat coupon value per meat meal. The caterer will then have to make his meat meals in such a way as to cover his meat purchases, for which he will have to surrender coupons according to general rules. He may, of course, try to give meals short of their actual coupon value, but this will probably be to a great extent prevented by competition.

coupons for buying fuel. Such a combined rationing by points would permit avoidance of differential rationing of each group taken separately, and it should be possible to devise a scheme which saves imports of clothing materials and does not throw coal consumption out of gear.'

I should like now to elaborate this proposal in some detail, namely the problem of fixing the point relation between clothing and coal. Suppose that the number of clothes coupons, after a moderate reduction as compared with the present level, is a, and the unknown number of coupons to be added for coal is x. The total number of interchangeable coupons will be $a + x$. Let us denote further the amount of fuel per coupon by y. A poor man will not be able to cut his consumption of clothing and footwear, therefore his fuel consumption will be xy. If we denote by b the level at which we want to fix it we have the equation

$$xy = b$$

Now a very rich man may abstain from buying clothes at all and spend all his coupons on fuel. His fuel consumption will therefore be $(a + x)\,y$. Let us now assume it is decided that he should not exceed the fuel consumption of the poor by more than $m\%$. We then obtain the second equation

$$(a + x)\,y = b\left(1 + \frac{m}{100}\right)$$

It may easily be obtained from these two equations that $x = a.\,\frac{100}{m}$ and $y = \frac{b}{a}.\,\frac{m}{100}$ If, for instance, m is 75%, then $x = 1.33a$ and $y = \frac{b}{1.33a}$

The scheme would also have the advantage of settling the difficulty arising out of the fact that families with many children require more clothes but usually less fuel, because they will be able to spend more of their coupons on clothes and less on fuel.

The value b of the fuel consumption per head of a poor household must be determined so as to balance the total demand for and supply of fuel for household use. The difference in climatic conditions of various regions may also be accounted for by varying the number of cloth-fuel coupons distributed in these regions.

M. Kalecki.

A NEW PLAN FOR THE NON-FOOD RETAIL TRADE

The author of the following article has had considerable experience of the retail trade. While the Institute of Statistics does not take responsibility for the plan of concentration proposed, we feel that, in view of the opposition which has greeted all plans so far put forward by the Retail Trade Committee, due consideration should be given to any scheme which offers a chance of solving the extraordinarily intricate problem of non-food retail distribution during the war.

The Editor.

The Third Report of the Retail Trade Committee was discussed in the House of Commons on July 23rd. 'There was no use denying the fact,' said the President of the Board of Trade, 'that the prevailing opinion amongst those he had consulted was definitely hostile to the

Retail Trade Committee's proposals, and that there was formidable opposition.' Mr. Dalton went on to say that he was examining carefully certain technical points. 'I would like to take action on the retail question, and to take action soon, but I must be sure it is the right action and that it has the support of the people concerned.'

What is the present position with regard to non-food retail trade? When the Committee was set up in the first half of 1941, the main task appeared to be to ensure the maximum release of labour for war industries. The Minister of Labour did not, however, await the result of the deliberations of the Committee; instead he has called up and is still calling up all the labour he needs. The *present* objective of retail trade policy is no longer, therefore, the maximum release of manpower, but the preservation of the structure of the trade in such a way that no section of it bears a disproportionate part of the inevitable war-time sacrifice of reduced turnover. That already the small and small medium shopkeepers have been severely hit, while the large shops, multiples, chain stores etc., have weathered the storm more easily, is well known. The emphasis of the last two Retail Trade Reports, as well as the discussion in the Press, has therefore been towards rescuing the small man. The Committee's Third Report contains no proposals for orderly withdrawals according to some objectively determined plan, but contents itself with recommending that the rent obligation of closed shops should be met from a central fund, financed by a levy on shops remaining in business. The details of this plan were discussed in the last BULLETIN; here we wish only to consider certain consequences which would follow from the scheme as it now stands.

1. *Large Traders.* There has already been some internal concentration by the large organisations, which are usually corporate enterprises, chiefly in the form of reduced counter space. The Committee's scheme provides for the payment of Standard Benefit where branches are closed by multiples or 'the closing of a floor or a distinct section of his premises' is carried out by a large trader. The proposed scheme (especially if closed departments or branches are freed of rates) may stimulate further concentration, although the financial gain appears rather small when offset against the loss of goodwill or advertisement associated with a particular site. 2. *Medium Traders.* To this very important group belong those retailers who have made a fair success of shopkeeping, and who provide most of the new ideas which pass into the trade. In many cases their origins are in very small shops and they have expanded by dint of hard work, service and ingenuity, and the elimination of these shopkeepers would have serious social and economic consequences. In such cases the loss of goodwill associated with withdrawal far outweighs any financial inducements offered by the present scheme. A member of this class stated: 'I would willingly close for the duration if I knew that . . . (his nearest rivals) were closing, but so far as I know they will not, as they have a good financial backing and they will secure my trade and goodwill which I shall not be able to regain after the war. So, as long as I can pay my rent I will continue to trade, even if I spend all my savings, in the hope that I can pull through.' This feeling, to judge from the opposition of some of the Associations, is widespread, and the Committee's scheme will only operate to relieve acute financial distress.

3. *Small Traders.* Casualties have already been very heavy in the ranks of the small trader, and the Special Benefit may be of genuine (though limited) value to those who, for reasons of age, or because they can find other employment, wish to withdraw permanently. But for those wishing to resume trade after the war a maximum of £125 (held on account by the Central Fund and accruing interest in the war years) is hardly enough to re-stock and re-open their business. In these cases also the problems of identity and goodwill are very important.

Thus the scheme which was designed to afford relief and protection to the small (and financially weaker) traders, appears to offer little attraction to any section of the trade, with the possible, and paradoxical, exception of the larger shops. The reason is because the issue of identity and goodwill has not been squarely faced. The scheme of 'pairing' proposed last September by Mr. Worswick in BULLETIN Vol. 3, No. 13, was a half-way house in this respect, but the Third Report states that voluntary 'pairing' has received little support in the trade. It would seem, therefore, that the only remaining solution is to eliminate *all* identities for the duration of the war.

A SCHEME FOR 'POOLING' ON A LOCAL BASIS

I propose the following plan, which, while liquidating the identity problem, also offers advantages from the financial and labour points of view. In nearly all towns and cities retail traders are represented by a Chamber of Trade or some analogous body. In the larger cities, such as Manchester, there are several organisations covering different districts and localities. It is suggested that 'pairing' or 'grouping' within the individual areas covered by these organisations be adopted on the following basis:

1. All traders to be members of the local organisation.
2. The local organisation to become the managing body of the local 'group.'
3. The local 'group' will:
   - (*a*) Buy stocks of all members.
   - (*b*) Concentrate stocks and businesses in most suitable premises from the point of view of trade and efficient service to the public.
   - (*c*) Be responsible for staffing and managing local shops.
   - (*d*) Be a profit making body.
   - (*e*) Distribute profits to members on a share basis.
4. Shares in the profits to be based on certified turnover during the twelve months ending on the announcement of the scheme.
5. Working capital to be provided by members in the form of subscription for Preference Shares carrying interest at, say, 5%.
6. Neutral name for groups such as 'Blackfield Traders Association Ltd.' to be adopted.
7. Neighbouring groups will co-operate when selecting shop sites.

To cover the essential differences between traders in central and suburban areas, central and suburban associations could be formed where not already in existence, but all traders in the respective geographic limits must join. Where multiples and similar organisations are represented their branches would join their local associations. Such associations could insist on a fair allocation of supplies particularly if the wholesale organisations were rationalised. The scheme would facilitate close co-operation with local National Service officers and the Control of Factory and Storage Premises. A considerable number of large buildings on central sites would be freed for official use. It is intended to work in conjunction with the official scheme and in this case the levy would be paid by, and the benefits paid to the various associations. It is urged that if adopted it will provide an orderly method of contraction of outlets at the moment, place shops where they can serve the public with greatest efficiency, provide for orderly expansion of outlets after the war and eventual re-entry, and be capable of great flexibility according to the needs of the situation. It is felt that the scheme would be particularly acceptable to small traders as they are treated equally with big shops, and all retain an interest in the trade. There may, however, be serious resistance from those sections of the trade which are confident that they can, in any case, with or without any compensation scheme, weather the storm. (The uncompromising attitude shown in the Minority Report signed by the representative of the Co-operative Societies is a case in point, but in this case there are certain special problems. The framework of the Co-operative Societies is in itself a minor model, on a national scale, of the sort of scheme proposed here for the whole non-food trade. There is therefore a strong case for excluding Co-operatives from the scope of my plan, provided they undertook to 'concentrate' to the same degree as the rest of the trade. In this way also the special difficulty of the co-operative 'dividend' under a scheme of local 'pooling' would be avoided.) Mrs. Tate, M.P., also a member of the Committee, argued very forcibly in the House of Commons that in order to maintain, or rather to restore, the already disturbed balance of the structure of the trade, the Government would have to use compulsion. The proper procedure would appear in this case to be to offer the plan to the trade, and if there is substantial support to carry it out on a compulsory basis.

The above is a suggestion and not a finished scheme, but if the principle is adopted it is felt that all the detailed problems could be solved.

G. L. NICHOLLS.

DIARY

THE CONTROL OF MANUFACTURE AND SUPPLY ORDER

The first Control of Manufacture and Supply Order, which will come into force on August 1, 1942, is the most important measure affecting non-essential industry introduced for over a year; in fact, since the Concentration policy and cloth rationing in March and June 1941. Not only is the concentration policy extended to cover certain goods hitherto outside its scope, but a new and more direct method of regulation of production is introduced by prohibiting the manufacture of certain goods, making subject to licence the manufacture of a further range of goods, and controlling directly the production of others. Manufacture and supply for export will no longer be exempt from licence, as was the case under the Limitation of Supplies Orders (though direct production for Government contracts is, in general, exempt). *All* manufacturers will be subject to licence requirements, though the scheme will not operate for firms employing less than 5 people until 1st October 1942.

Those goods whose production is now to be controlled by direct licence of individual manufacturers will be exempt from the Limitation of Supplies Orders. The control of wholesalers, hitherto exercised over sales by the Limitation of Supplies quotas, will not continue, except for aluminium hollow-ware (the supply of which remains prohibited at all stages), and electric space-heating apparatus.

The schedule of goods controlled under the new order embraces nine categories: floor coverings, hollow-ware and kitchen hardware, metal furniture, domestic electrical appliances, mechanical lighters, sports and games, musical instruments, fountain pens, umbrellas.

Various arrangements are made with regard to stocks, the disposal of which is licensed in some cases and not in others, and in two cases for meeting the needs of priority consumers (i.e. sports equipment for the armed forces etc., and musical instruments which will go only to certain categories of users such as E.N.S.A., the B.B.C. and educational institutions).

Apart from the regulation of production undertaken by the Control of Manufacture and Supply Orders, certain goods are to be prohibited outright. With certain exceptions (toys, jewellery and cutlery) supplies by manufacturers of prohibited goods will be free up to a period varying between 31st August 1942 and 31st October 1942. In certain special cases, i.e. where it can be shown that the labour and premises employed by some firms cannot be used for more essential purposes, licences will be granted. The prohibition of production is calculated partly to save raw materials in short supply (e.g. gold above a certain grade of fineness, cutlery made out of non-ferrous metals, toys using rubber, cork, hemp etc.), or to eliminate luxury articles (e.g. leather attaché cases etc., coin or disc operated machines, luxury cutlery and glassware, hand operated lawn mowers, domestic furniture made of material other than metal, except as set out in a separate schedule).

This new regulation is to be welcomed as a manifestation of a new spirit in the Board of Trade originating with the appointment of Mr. Dalton as President, and, together with the designation of firms in the clothing trades, is a step in the right direction.

It is regrettable, however, that, except in the case of musical instruments and sporting goods, there is no provision for regulating the *demand* for goods whose supply is directly controlled. A sharp fall of available supply without such regulation of demand according to needs will unquestionably lead to a gross maldistribution of supplies (even though the general lowering of the qualities may deter people with previous supplies from purchasing commodities if their needs are not urgent). In some cases, especially furniture, a wastage of manpower and material is allowed to continue, which could be prevented completely or partially by requisitioning all existing stocks (e.g. of new and second-hand furniture) and restricting supply to consumers who really need it. Only the balance between available stocks and essential needs should be made up by current manufacture.

It is also to be regretted that the new control has not been paralleled with a control of distribution. The threat to the small retailer (in contrast to the bigger shops having influential connections with manufacturers) is further aggravated. This is likely to have serious social effects.

Finally, unnecessary difficulties will arise because no scheme of compensation has been elaborated by the Board of Trade to deal with the extremely acute problems of all manufacturers whose output is now directly regulated.

RUBBER SUPPLIES

The few months which have passed since the loss of the Far Eastern rubber supplies have again shown the basic unity of peace, war, and post-war economy. Cartel and quota restrictions originating in the pre-war period, as well as the expected post-war competition between natural and synthetic, between primary and re-treaded rubber, are affecting the present supply position. The interests of the Far Eastern rubber plantations, of which the value of the lost investments is about £250 millions, the chemical and tyre industries are all involved, and these interests have not failed to make themselves felt.

Accumulation of sufficient reserves of crude rubber was resisted by importers and impeded by low export quotas for rubber (50% in 1939; 83¾% in 1940). Even now a meaningless quota (125%) is maintained for the small output of India and Ceylon. More decisive, however, were restrictions of the type mentioned in U.S.A. during 'the most important anti-trust case in history.' The Standard Oil Co. was indicted on the grounds that, under German direction, it had refused the licensed use of its synthetic rubber process to independent producers in U.S.A., although informing Germany of this process. Cartel agreements, such as that with I. G. Farben, concluded in September 1939, were considered the principal cause of the present shortage of synthetic rubber. Apart from being fined, Standard Oil had to agree to free public licensing for the duration of the war of patents covering synthetic rubber and petrol.

This obligation is of primary interest to this country since Standard Oil has developed a new process which can simultaneously produce butadiene, the raw material for synthetic rubber, and what is termed '100 octane'—i.e. highest grade—aviation spirit. Up to now suggestions to produce synthetic rubber in the U.K. have been turned down by the Government on the ground that the import of the necessary raw material would impose a heavy additional burden on our shipping resources since only 10 tons of rubber can be produced out of 100 tons of crude oil; even allowing for by-products less shipping would be required if synthetic rubber were imported instead of oil for rubber. Those in favour of synthetic rubber production here point out that such rubber can be obtained cheaply from the products of the coke and gas industry. Moreover the import of crude oil for the alternative process would not augment the shipping space needed, for the remaining 90 tons of oil would have to be imported in any case in the form of lubricating oil, motor spirit etc. Also the special ship-fittings required to prevent contamination of these oils are not needed for the shipment of crude oil.

It is further pointed out that shipments of rubber from U.S.A. should not be relied upon since that country experiences a serious shortage herself. In March Mr. Jesse Jones, Secretary of Commerce, stated that U.S.A. would produce 90,000 tons of synthetic rubber in 1942, 250,000 tons by June 1943, and at least 700,000 tons by the end of 1943. In July, Mr. Donald Nelson declared that production for 1942 would amount to only 32,000 tons; 338,000 tons were expected for 1943 and 670,000 tons for 1944. But according to the recently published report of the

Truman Committee (including evidence of Mr. L. Henderson) to the Senate, a production of some 350,000 tons in 1943 is highly improbable and exhaustion of the reserves of crude rubber has to be expected during May 1943, however much civilian consumption is cut. The report mentions that two years after the fall of France no new synthetic rubber plant was in operation, and that in May 1941 the first contracts for plants with a total capacity of 10,000 tons a year were placed, but plans for adequate raw material supplies for this production were lacking. The creation of a 700,000 tons production of Buna-S rubber is stated to exist only in the form of plans. The Committee is convinced that the rubber shortage is both extremely acute and likely to continue for the duration of the war.

It should be noted that the report was submitted on May 26th and that the erection of the necessary synthetic rubber plants is said to take 15—18 months (a year ago it had been estimated at 2—4 years). The issue has been complicated by the coming elections in U.S.A. To secure the votes of farmers faced with a record wheat glut, members of Congress are advocating the production of synthetic rubber mainly from grain-alcohol instead of from oil; a process which calls for quite different plants and preparations.

American yearly war-time requirements are estimated at 800,000 tons. At present, in 1942, at best 32,000 tons of synthetic rubber will be produced. Crude rubber reserves amounted to 700,000 tons at the beginning of 1942, and to only about 450,000 tons at the end of May. 100,000 tons of crude rubber may come forward from Ceylon, South America, Mexico and other sources. U.S.A. possesses a 300,000 tons yearly capacity for reclaiming rubber. But in spite of 10—20 million tons of scrap rubber to be found in U.S.A., so little is collected that only 50% of reclaiming capacity is employed and scrap rubber is imported from U.K. This country, on the other hand, has to import the bulk of her rubber needs since her own reclaiming capacity amounts still to only 10% of rubber consumption. Scarce shipping space has thus to be used for a largely avoidable two-way transport of highly inflammable material.

May 1943 may indeed represent the extreme limit for crude rubber reserves. Assuming that in spite of the shortage of structural steel for new plants, and in spite of the other disturbances, the 1943 plan will be fulfilled, there would still be a rubber shortage in the second half of the year. U.S.A. and Great Britain have placed contracts with and given subsidies to all potential rubber growing countries, but it will take some time before this policy will bear fruit.

HOME GROWN TIMBER AND THE SHIPPING POSITION.

The United Kingdom imported 10 mill. tons of timber in 1937, home production covering less than 10% of total consumption. In weight, timber headed the list of imported goods, followed by iron ore (7 mill. tons) and grain and flour—excluding maize—(6½ mill. tons). During the last war it proved possible to reduce imports from 11.5 to 3 mill. tons but it is unlikely that in this war imports are as low. War requirements to a considerable extent counterbalanced economies that were effected in civilian use, and half—or slightly less—of the total consumed has still to be brought from overseas in spite of a large increase in home production.[1]

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[1] *Timber Trades Journal*, January to June, 1942.

Between spring 1940 and autumn 1941 Canada was the main source for soft wood (which in bulk represented 90% of total imports before the war). The first months of 1942 saw a spectacular fall in Canadian exports to this country : comparing the first quarter of 1941 with the same period of 1942 they fell from 300,000 to 65,000 tons ;[1] (no estimate of total Canadian exports to the U.K. can be made from these figures because exports are usually low at the beginning of the year).

This reduction would not have been possible but for a steady increase in home production and the rather unexpected shipments of timber from Northern Russia which started at the end of last summer and are said to have made good to some extent the diminution in the Canadian trade. Ships that had taken munitions and other commodities to Archangel and Murmansk were loaded with 'whatever wood was handy and suitable for the needs of this country.'[1] Transports to Russia thus involved less strain on the shipping position, because ships which actually carried munitions to White Sea ports would otherwise have had to go to Canada—in ballast—to bring wood from there.

However, as long as shipping is needed to import timber from the Western hemisphere there remains the imperative need of increasing home output. According to the results of the recent census of standing timber the quantity that can be felled is larger than anticipated and reasonably adequate to last the period of the war, even if it extends over several years. Although native wood is for some purposes less suitable than imported timber, many complaints about its quality are due rather to the way it is being prepared and seasoned, and it should therefore be possible to remedy the position.

Difficulties due to shortage of labour and equipment are being tackled mainly by the use of military Forestry Units from the Dominions, of which new contingents arrived quite recently, by the formation of the Women's Timber Corps at the beginning of this year and by imports of machinery under Lend and Lease from the U.S. There seems to be less need for new methods to increase output than for an intensification of measures already taken: such as an extension of piece work and the levelling up of productivity of less efficient areas of operations. A factor particular to forestry work is the need for selecting operations with due regard to the location of roads saw-mills and railway stations. In spite of a recent increase the standard wage rate for foresters of 64s. is still far below the average in urban industries.

The main bar to a further extension of output is, however, lack of labour, lorries, railway trucks, and saw-mill machinery, and these shortages should be viewed against the background of the present shipping position. The increase in home production that is planned by the Home Grown Timber Department for the current year will lead to a saving of shipping space of 500,000 tons, twice the amount estimated to have been saved as the result of the rationing of clothing,[2] but it need not be the limit of what can be achieved.

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[1] *Timber Trades Journal,* January to June, 1942.

[2] *Manchester Guardian,* 18/5/42.